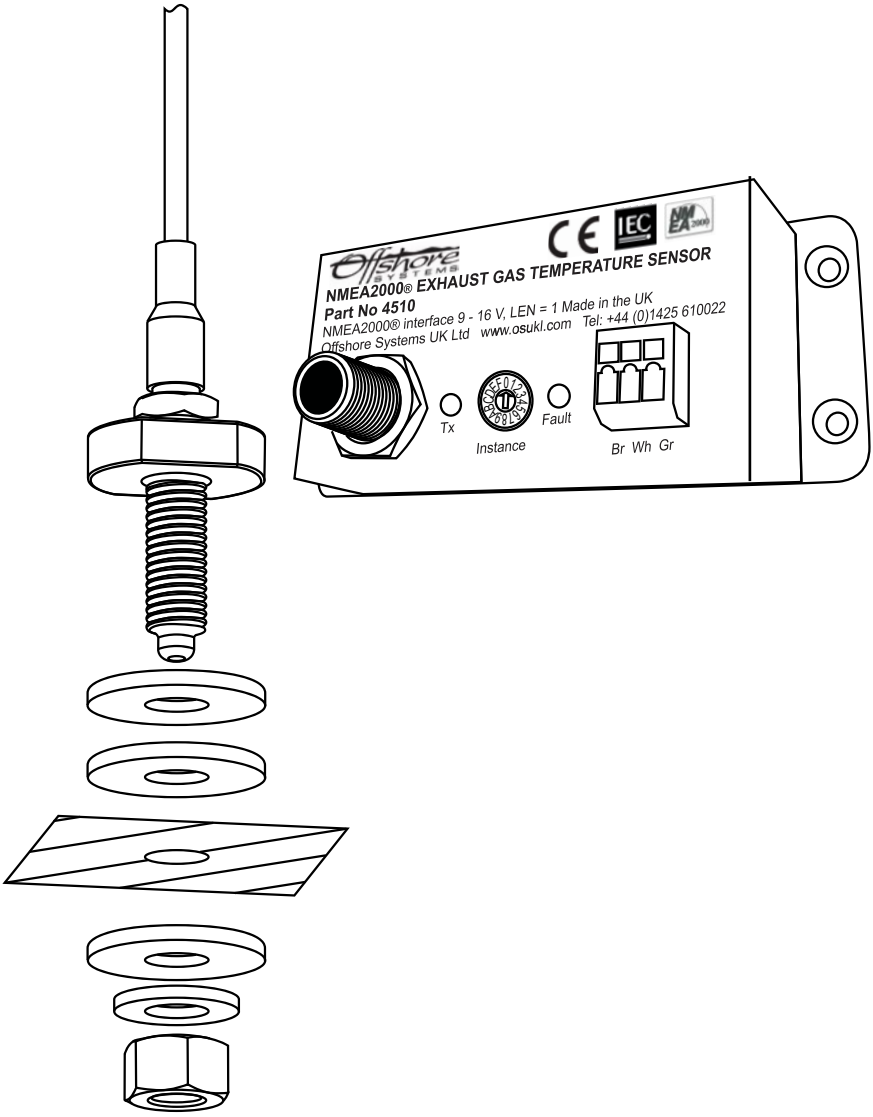
NMEA2000® EXHAUST GAS TEMPERATURE MODULE & PROBE :Part Numbers: 4510
USER MANUAL


NMEA2000® EXHAUST GAS TEMPERATURE SENSOR
Part No 4510
NMEA2000® interface 9 - 16 V, LEN = 1 Made in the UK
Offshore Systems UK Ltd www.osukl.com Tel: +44 (0)1425 610022
Tx
Instance
Fault
Br Wh Gr

Revision 1.0.1

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1 INTRODUCTION

The Offshore System's NMEA2000® 4510 Exhaust Gas Temperature Module and Probe is designed to measure the exhaust gas temperature of a marine engine or generator using a highly accurate Type T thermocouple and report it's value on the NMEA2000® network.

This unit is designed to operate in a protected marine environment such as an engine room. It is very important that it is installed and set up correctly according to this manual. Please read and follow the installation and setup instructions carefully to achieve the best results.

This module forms an important part of our NMEA2000® Intergrated Alarm, Control and Display System.

1.1 Firmware Revision

The information in this manual corresponds to firmware revision 1.00

1.2 Product Features

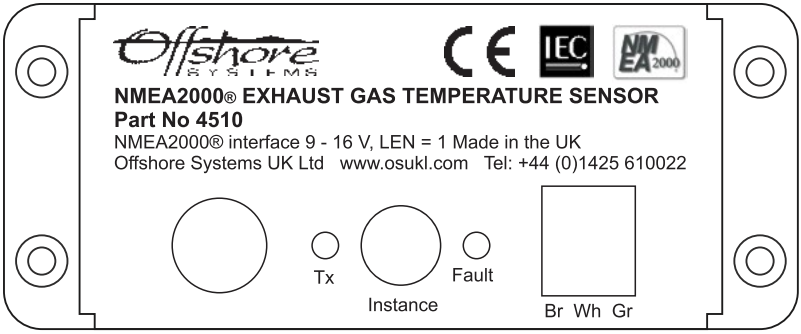
The 4510 NMEA2000® Exhaust Gas Temperature Module and Probe has the following features:

- Accurate, wide ranging (-20˚C to +300˚C), Type T Thermocouple probe element
- Stainless Steel sheathed 3 metre screened thermocouple cable
- Corrosion resistant Duplex Stainless Steel probe housing
- Probe housing suitable for tapped exhaust riser or exhaust hose mounting
- Switch selectable NMEA2000® Device Instance
- Blue LED confirming NMEA transmission
- Red warning LED if probe element or cable damaged
- Power drawn only from NMEA2000 interface
- Panel mounting

2 INSTALLATION

2.1 UNPACKING THE BOX

You will find the following items in the shipping box:
1 x 4510 NMEA2000® Exhaust Gas Temperature Sensor Control Box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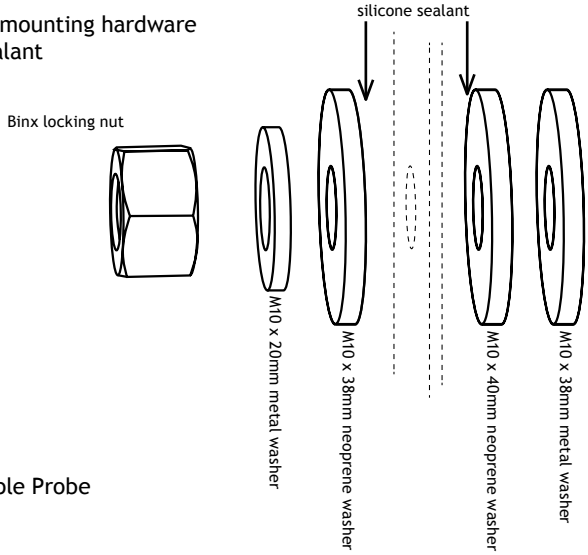
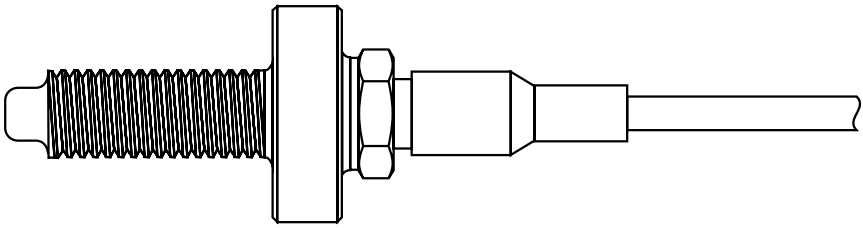
1 x Probe Housing and mounting hardware
1 x Tube of silicone sealant


silicone sealant
Binx locking nut
M10 x 20mm metal washer
M10 x 38mm neoprene washer
M10 x 40mm neoprene washer
M10 x 38mm metal washer

1 x Type T Thermocouple Probe



1 x 4510 User Manual (This document)

2.2 Mounting the Probe Housing

CAUTION: DO NOT START WORK UNLESS ENGINE IS TURNED OFF AND IS COOL.

Remove the exhaust hose from the Engine Riser by releasing any clips and carefully prise off the exhaust hose. Use a sharp 3/8" / 10mm drill bit to drill a hole in the top of the hose about 80mm down from the end of the riser spigot.

Mount a large metal washer, followed by a rubber washer, onto the M10 threaded section of the probe housing and coat the rubber washer with some of the silicone sealant supplied. Then push the probe through the 10mm hole in the exhaust pipe as far as it will go. Take the second rubber washer, coat it with silicon sealant and place it on the probe inside the exhaust pipe along with the large metal washer and the M10 Binx metal locking nut.

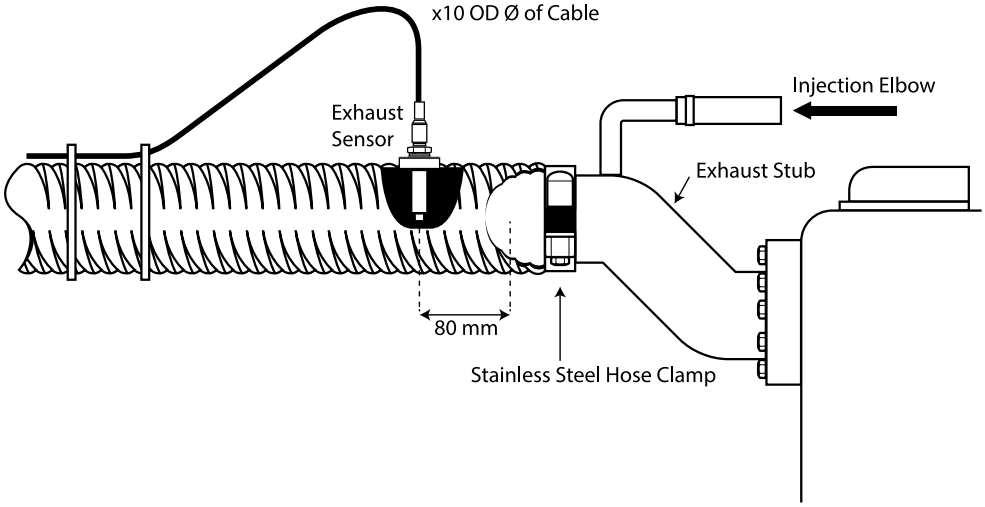
Tighten the M10 nut onto the probe until it is fully seated and the probe is securely fastened to the exhast hose. Please note that this is a metal self locking nut and it will be tight to turn. Finish off by applying silicon sealant around the washers and nut insde the exhaust hose to guard against any leaks.

2.3 Mounting the Probe

Screw the M8 threaded part of the probe into the probe housing until it can go no further then tighten the M8 locknut to stop it vibrating loose.

Undo the cable ties on the shielded cable and run the cable to the position where the sensor box is to be mounted in the next instruction.

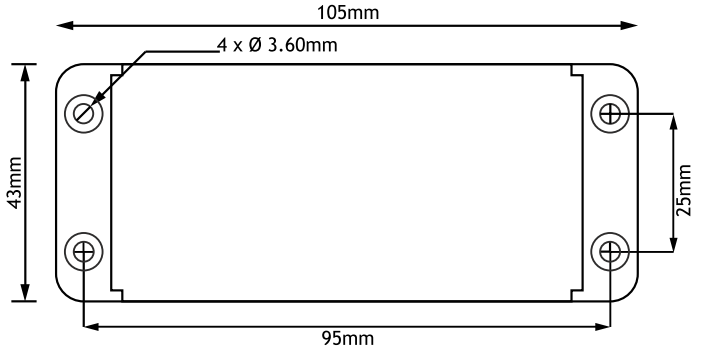
Be careful not to force the cable to a tight angle where it comes out of the probe but run it as shown in this diagram.



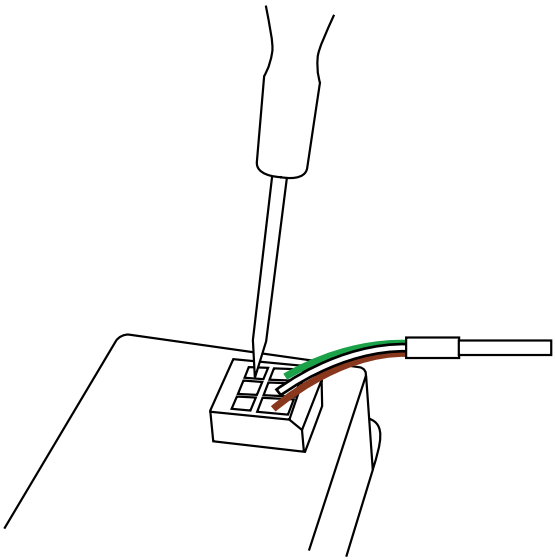
Use cable ties to prevent the stainless steel shrouded cable from chafe or damage.

2.4 Mounting the Sensor Control Box

This unit must be mounted in an area protected from water and physical damage within 3 metres of the Probe Element. It should be securely attached to a flat panel using 4 suitable mounting screws. The unit dimensions and the mounting hole locations are shown in the following drawing:



2.5 Connecting the Thermocouple cable to the WAGO socket



The wires from the Thermocouple Cable are connected to the WAGO cage clamp terminal block by placing a small screw driver in the slot above the terminal turning it to open the cage clamp. Insert the wire into the terminal block and withdraw the screwdriver to allow the cage clamp to make a good connection onto the bared wire end.

Check that the cage clamp is making contact with the bared wire end and is not seated onto the wire insulation.

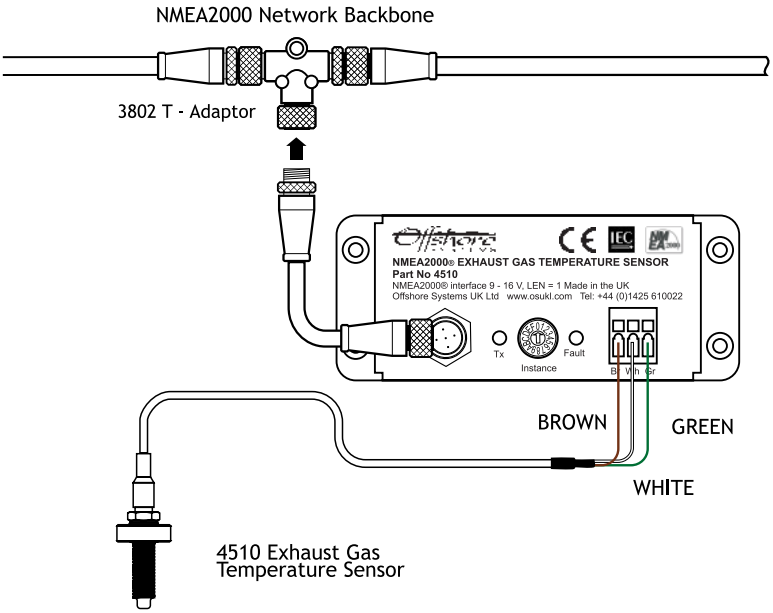
The coloured wires should be connected as follows:

- ✓ Brown Wire to Br terminal
- ✓ White wire to Wh terminal
- ✓ Green wire to Gr terminal.

If the wires are incorrectly placed no damage will occur, but the unit will not measure the temperature correctly and the Red Fault LED will illuminate. If this happens check and correct these connections.

2.6 Connecting the NMEA2000 Cable

The unit is connected to the NMEA2000® network by the 5 way micro C socket on the front. Carefully attach the network drop cable to this plug and hand tighten until it it is fully seated. Take care to match the orientation of the keyway inside the socket to the recess inside the drop cable plug. The other end of the drop cable should be connected to a suitable Tee connector on the NMEA2000 network backbone cable.



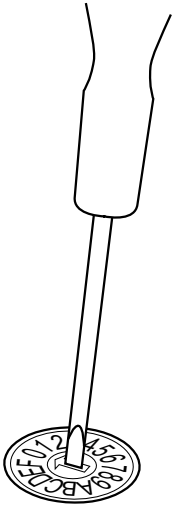
2.7 Final Checks before Starting Engine

- ✓ Ensure that the exhaust hose is fully seated on the riser and it's clips and clamps are secure.
- ✓ Ensure that all wiring is secured safely to good marine practice.
- ✓ Ensure all connections are fully made and secure
- ✓ Ensure any sea cocks closed during installation are returned to there normal state.

3 CONFIGURATION

Each 4510 Exhaust Gas Temperature Sensor connected to the NMEA2000® network needs to have a unique Device Instance Address. The Device Instance and Temperature Instance of each unit is set by turning the small rotary switch with a small screw driver.

Valid Device Instances and Temperature range from “0” through to “F”.



We STRONGLY recommend that the following Device Instances are used:

Port or single Main Engine	Device Instance 0
Starboard Main Engine (if fitted)	Device Instance 1
Mid Main Engine	Device Instance 2
Port Generator	Device Instance 3
Starboard Generator	Device Instance 4

By using these instances the Offshore Systems 4515 Exhaust Gas Overtemperature Alarm Panel will show the correct warnings.

4 TECHNICAL DATA

NMEA2000® Parameter Group Numbers (PGNs)

Type	PGN No	PGN Name
Periodic Data PGNs	PGN130316	Temperature Extended Range
Protocol	PGN126464	Tx/Rx PGN List
	PGN126996	Product Information
	PGN059392	ISO Acknowledge
	PGN059904	ISO Request
	PGN060928	ISO Address Claim
	PGN126208	Command/Request Group
	PGN130312	Temperature

Certifications

Parameter	Comment
NMEA2000	Certified
Maritime Nav and RadioComm Equipment	Designed to IEC60945
CE and FCC	Electromagnetic Compatibility

Electrical and Mechanical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	45mA	Average Operating
Load Equivalence Number	1	LEN
Reverse Battery Protection	Yes	Indefinately
Load Dump Protection	Yes	SAE J1113
Size	mm	105 x 43 mm
Weight	g	100g

Environmental

Parameter	Value
IEC 60954 Classification	Protected
Degree of Protection	IP30
Operating Temperature	-25˚C to 50˚C
Storage Temperature	-40˚C to 70˚C
Relative Humidity	93%RH @40˚ per IEC60945-8.2

Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s2 per IEC 60945-8.7
Electromagnetic Emission	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

5 TROUBLESHOOTING

If the data from the unit is not as expected check the following:

- If the Red LED is on this means that the probe or probe cable may be damaged. Check that it is still securely mounted in the cage clamp connections and the run of cable is secure and undamaged.
- If the red LED is NOT on is the blue LED flashing two times per second to indicate power is on the unit and a message is being transmitted. If this is flashing OK then check that the device instance switch is set to the value required by the display unit.
- If the blue LED is not flashing then check that the network has power and this unit is correctly connected to the network
- If the blue LED is flashing irregularly then check that the network is correctly wired and at least one other NMEA2000® device is attached.

6 WARRANTY

Offshore Systems warrants this product to be free from defects in materials and workmanship for one year from the date of original purchase. If within the applicable period any such products shall be proved to Offshore Systems satisfaction to fail to meet the above limited warranty, such products shall be repaired or replaced at Offshore Systems option. Purchaser's exclusive remedy and Offshore Systems sole obligation hereunder, provided product is returned pursuant to the return requirements below, shall be limited to the repair or replacement, at Offshore Systems option, of any product not meeting the above limited warranty and which is returned to Offshore Systems; or if Offshore Systems is unable to deliver a replacement that is free from defects in materials or workmanship, Purchaser's payment for such product will be refunded. Offshore Systems assumes no liability whatsoever for expenses of removing any defective product or part, or for installing the repaired product or part or a replacement therefore or for any loss or damage to equipment in connection with which Offshore Systems products or parts shall be used. The foregoing warranties shall not apply with respect to products subjected to negligence, misuse, misapplication, accident, damages by circumstances beyond Offshore Systems control, to improper installation, operation, maintenance, or storage, or to other than normal use or service.

THE FOREGOING WARRANTIES ARE EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE.

Statements made by any person, including representatives of Offshore Systems, which are inconsistent or in conflict with the terms of this Limited Warranty, shall not be binding upon Offshore Systems unless reduced to writing and approved by an officer of Offshore Systems.

IN NO CASE WILL OFFSHORE SYSTEMS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, DAMAGES FOR LOSS OF USE, LOSS OF ANTICIPATED PROFITS OR SAVINGS, OR ANY OTHER LOSS INCURRED BECAUSE OF INTERRUPTION OF SERVICE. IN NO EVENT SHALL OFFSHORE SYSTEMS AGGREGATE LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT(S) INVOLVED. OFFSHORE SYSTEMS SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES, WHETHER ARISING OUT OF BREACH OF CONTRACT OR WARRANTY, TORT (INCLUDING NEGLIGENCE), OR OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY OFFSHORE SYSTEMS, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO.

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WARRANTY RETURN PROCEDURE

To apply for warranty claims, contact Offshore Systems or one of its dealers to describe the problem and determine the appropriate course of action. If a return is necessary, place the product in its original packaging together with proof of purchase and send to an Authorized Offshore Systems Service Location. You are responsible for all shipping and insurance charges. Offshore Systems will return the replaced or repaired product with all shipping and handling prepaid except for requests requiring expedited shipping (i.e. overnight shipments). Failure to follow this warranty return procedure could result in the product's warranty becoming null and void.

Offshore Systems reserves the right to modify or replace, at its sole discretion, without prior notification, the warranty listed above.

7 TECHNICAL SUPPORT

If you require technical support for any Offshore Systems products you can reach us using any of the following ways:

- Tel: +44(0)1425 610022
- Fax: +44(0)1425 614794
- Email: support@osukl.com
- Web: www.osukl.com
- Post: Offshore Systems UK Ltd
  Unit 10-11 Milton Business Centre
  Wick Drive, New Milton, Hampshire BH25 6RH

Offshore Systems (UK) Ltd
Unit 10-11 Milton Business Centre, Wick Drive,
New Milton, Hampshire, BH25 6RH, United Kingdom

Tel: +44(0)1425 610022 Fax: +44(0)1425 614794
Email: sales@osukl.com Web: www.osukl.com

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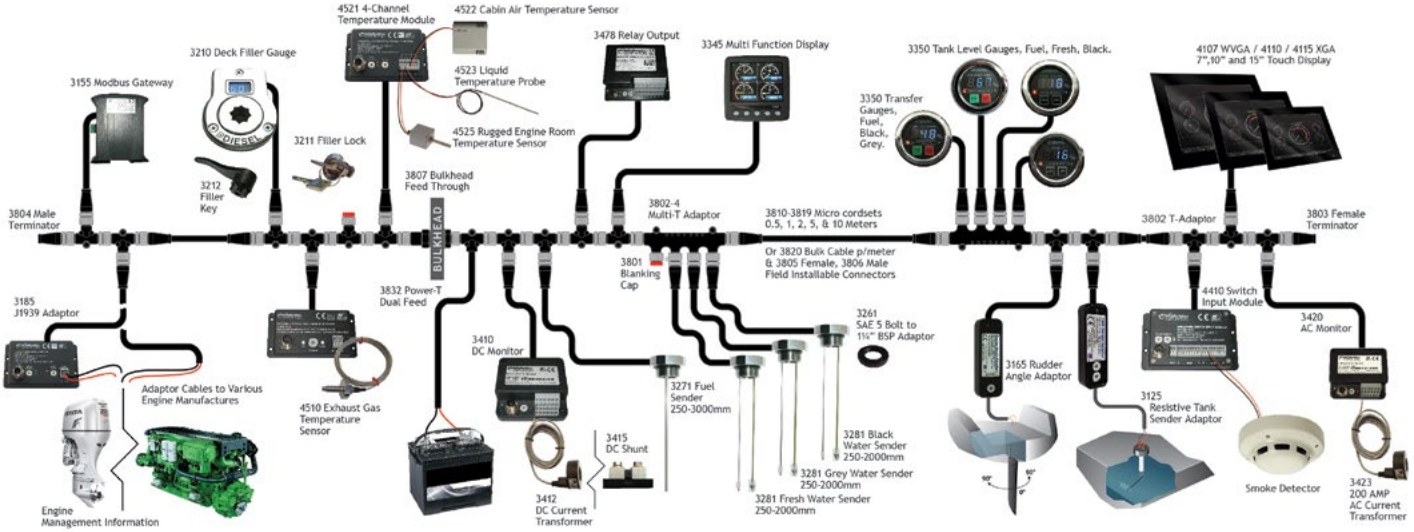
NMEA2000® VESSEL MONITORING AND CONTROL SYSTEMS


4521 4-Channel Temperature Module
4522 Cabin Air Temperature Sensor
3210 Deck Filler Gauge
3478 Relay Output
3345 Multi Function Display
3350 Tank Level Gauges, Fuel, Fresh, Black.
4107 WVGA / 4110 / 4115 XGA 7",10" and 15" Touch Display
3155 Modbus Gateway
4523 Liquid Temperature Probe
3350 Transfer Gauges, Fuel, Black, Grey.
3211 Filler Lock
4525 Rugged Engine Room Temperature Sensor
3212 Filler Key
3807 Bulkhead Feed Through
3804 Male Terminator
3802-4 Multi-T Adaptor
3810-3819 Micro cordsets 0.5, 1, 2, 5, & 10 Meters
3802 T-Adaptor
3803 Female Terminator
Or 3820 Bulk Cable p/meter & 3805 Female, 3806 Male Field Installable Connectors
3801 Blanking Cap
3185 J1939 Adaptor
3832 Power-T Dual Feed
3261 SAE 5 Bolt to 1¼" BSP Adaptor
4410 Switch Input Module
3420 AC Monitor
3410 DC Monitor
3165 Rudder Angle Adaptor
3125 Resistive Tank Sender Adaptor
3271 Fuel Sender 250-3000mm
Adaptor Cables to Various Engine Manufactures
4510 Exhaust Gas Temperature Sensor
3281 Black Water Sender 250-2000mm
3281 Grey Water Sender 250-2000mm
3281 Fresh Water Sender 250-2000mm
3415 DC Shunt
Smoke Detector
3412 DC Current Transformer
3423 200 AMP AC Current Transformer
Engine Management Information
BULKHEAD

Up to 16 of each type of Sender can be installed on a single network